

WHAT IS CLAIMED IS:

1. A transgenic, non-human mammalian animal that expresses a heterologous, recombinant physiologically-functional fibrinogen holoprotein or individual subunits thereof and secretes said holoprotein or subunit into a body fluid of said animal.

2. An animal of claim 1, wherein said animal has stably integrated in its genome heterologous fibrinogen subunit chain-encoding DNA sequences comprising the A α , B β and G γ DNA sequences encoding, respectively, a different subunit chain polypeptide of said fibrinogen, and wherein each of said heterologous DNA sequence is operably linked to a cis-acting, expression promoter-containing regulatory sequence.

Sub β 2 3. An animal of claim 2, wherein said promoter is a whey acid protein promoter.

4. An animal of claim 2, wherein said promoter is a casein promoter.

5. An animal of claim 2, wherein said promoter is a β -lactoglobulin promoter.

6. An animal of claim 2, wherein said promoter is an α -lactalbumin promoter.

7. An animal of claim 1, wherein said fibrinogen is human fibrinogen.

8. An animal of claim 1, wherein said fibrinogen is non-human animal fibrinogen.

9. An animal of claim 1, wherein said fibrinogen protein comprises an individual fibrinogen subunit chain polypeptide selected from the group consisting of A α , B β and G γ subunit chain polypeptides.

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10. An animal of claim 9, wherein said animal has stably integrated into its genome a heterologous fibrinogen subunit chain-encoding DNA sequence selected from the group consisting of A α , B β and G γ DNA sequences encoding, respectively, the three subunit chain polypeptides of said fibrinogen, and wherein each heterologous DNA sequence is operably linked to (i) a *cis*-acting, expression promoter-containing regulatory sequence and (ii) a sequence encoding a transmembrane secretory signal peptide for directing the secretion of said fibrinogen subunit into a body fluid of said animal

11. An animal of claim 1, wherein said animal is a rodent, rabbit, cat, dog, pig, sheep, goat, cow or horse.

12. An animal of claim 1, wherein said fibrinogen protein comprises a modified fibrinogen molecule.

13. An animal of claim 1, wherein said fibrinogen protein comprises a fusion protein with a non-fibrinogen protein.

14. An animal of claim 12, wherein said non-fibrinogen protein is a milk protein selected from the group consisting of whey acid protein, casein, α -lactalbumin and β -lactoglobulin.

15. A process for producing a heterologous recombinant physiologically functional fibrinogen holoprotein, comprising the steps of:

(a) providing a transgenic, non-human animal within whose genome is stably integrated heterologous fibrinogen subunit chain-encoding DNA sequences comprising A α , B β and G γ DNA sequences encoding, respectively, a different fibrinogen subunit chain polypeptide, and wherein each said heterologous DNA sequence further includes a *cis*-acting, expression promoter-containing regulatory sequence operably linked to said heterologous DNA sequence;

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- (b) collecting a body fluid of said animal; and
- (c) isolating from said body fluid said expressed fibrinogen protein.

Sub B4

16. A process of claim 15, wherein said promoter is a whey acid protein promoter.

17. A process of claim 15, wherein said promoter is a casein promoter.

18. A process of claim 15, wherein said promoter is a β -lactoglobulin promoter.

19. A process of claim 15, wherein said promoter is an α -lactalbumin promoter.

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20. A process of claim 15, wherein said fibrinogen protein is synthesized as a fusion protein with a non-fibrinogen protein.

21. A process of claim 20, wherein said non-fibrinogen protein is a milk protein selected from the group consisting of whey acid protein, casein, γ -lactalbumin and β -lactoglobulin.

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22. A process of claim 15, wherein said transgenic animal is a rodent, rabbit, cat, dog, pig, sheep, goat, cow or horse.

23. A process of claim 15, wherein said fibrinogen protein is human fibrinogen.

24. A process of claim 15, wherein said fibrinogen protein is rodent, rabbit, cat, dog, pig, sheep, goat, cow or horse fibrinogen protein.

25. A process of claim 15, wherein said body fluid is milk.

26. A process of claim 15, wherein said body fluid is blood or a fraction thereof.

27. A process of claim 15, wherein said body fluid is urine.

28. A process of claim 15, wherein said fibrinogen protein produced comprises a fibrinogen subunit chain polypeptide selected from the group consisting of A α , B β and G γ subunit chain polypeptides, and said DNA sequence further comprises a secretory signal peptide-encoding DNA

Sub B7 29. A process of claim 15, wherein said fibrinogen protein comprises a modified fibrinogen molecule.

30. A plasmid selected from the group consisting of plasmid pUCWAP4 (ATCC Accession No. _____), plasmid pUCWAP5 (ATCC Accession No. _____), plasmid pUCWAP5/FIB A α (ATCC Accession No. _____), plasmid pUCWAP5/FIB B β 1 (ATCC Accession No. _____), and plasmid pUCWAP5/FIB G γ 1 (ATCC Accession No. _____).

Sub B8 31. A prokaryotic cell transformed by a plasmid according to claim 30.

Add A1

Add B9

add C1